

PFBA and Drinking Water

PFBA

Perfluorobutanoic acid (PFBA) is one of a group of related chemicals known as perfluorochemicals (PFCs). These are also called perfluorinated alkylated substances (PFAS). This group of chemicals is commonly used in non-stick and stain-resistant consumer products, food packaging, fire-fighting foam, and industrial processes.

PFBA is a breakdown product of other PFCs used in stain-resistant fabrics, paper food packaging, and carpets. PFBA was also used for manufacturing photographic film. The 3M Company was once a major manufacturer of PFBA and products containing PFBA but production was phased out in 1998.

PFBA in Minnesota Waters

The Minnesota Pollution Control Agency (MPCA) has detected PFBA in Minnesota rivers that have been tested for PFCs. Most test locations were downstream from towns or cities. PFBA was more commonly detected than other PFCs in those waters.^{1,2}

PFBA has been detected in private drinking water wells and public drinking water systems in several parts of Minnesota where known industrial use or disposal of PFBA occurred in the past. PFBA has been detected in sources of public drinking water at levels up to 3.5 parts per billion (ppb).³ MDH and MPCA routinely sample affected areas for PFBA and related chemicals.

MDH Guidance Value

Based on available information, MDH developed a guidance value of X.XX ppb for PFBA in drinking water. MDH guidance values are developed to protect people who are most vulnerable to the potentially harmful effects of a contaminant. A person drinking water at or below the guidance value would be at little or no risk for harmful health effects.

Potential Health Effects

In laboratory animal studies, effects of PFBA exposure included thyroid and liver effects, such as increased thyroid and liver weight, changes in thyroid hormones, decreased cholesterol, and cellular changes in both organs. Other effects of PFBA exposure included delayed developmental milestones, changes in body weight, and decreased red blood cells and hemoglobin. Studies of PFBA in people are lacking.

Potential Exposure to PFBA

PFBA has been detected in the blood of people exposed to PFCs, but is less common than other PFCs. The human body is able to eliminate PFBA faster than some other PFCs.⁴

**Exhibit
3746**

State of Minnesota v. 3M Co.,
Court File No. 27-CV-10-28862

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For people living in areas affected by PFC release or disposal, drinking water may be a major source of PFBA exposure. Reverse osmosis and activated carbon filter treatment systems can reduce the levels of PFBA in drinking water in your home.

Some PFCs transfer from a mother to infant during pregnancy and to an infant through breastmilk. Breastfeeding is important for the short and long term health of both a mother and infant. MDH recommends that women currently breastfeeding, and pregnant women who plan to breastfeed, continue to do so. Exclusive breastfeeding is recommended by doctors and other health professionals. If formula is used by those living in affected areas, it should be prepared only with treated or bottled water.

PFBA in the Environment

While industrial production and use of PFBA has declined in recent years, PFBA can be formed in the environment as a breakdown product of related PFCs that are still in use. PFBA is persistent in the environment, meaning it does not break down easily in soil or water. PFBA more easily dissolves in water than other PFCs and does not stick to soil. This means it can move faster in the environment and may contaminate large areas of groundwater. In several large areas of Minnesota, PFBA has moved into groundwater over the course of many years.

Health Risk Assessment Unit

The MDH Health Risk Assessment Unit evaluates the health risks from contaminants in drinking water sources and develops health-based guidance values for drinking water. MDH works in collaboration with the Minnesota Pollution Control Agency and the Minnesota Department of Agriculture to understand the occurrence and environmental effects of contaminants in water.

References

1. National Water Quality Monitoring Council. 2017. Water Quality Portal (<https://www.waterqualitydata.us>). Accessed April 2017.
2. Minnesota Pollution Control Agency (MPCA). 2013. "Perfluorochemicals in Mississippi River Pool 2: 2012 Update." Retrieved from <https://www.pca.state.mn.us/sites/default/files/c-pfc1-21.pdf>. Accessed April 2017.
3. Minnesota Drinking Water Information System (MNDWIS). 2017. Accessed by MDH staff April 2017.
4. Minnesota Department of Health. 2009. "Environmental Public Health Tracking and Biomonitoring in Minnesota." Retrieved from <http://www.health.state.mn.us/divs/hpcd/tracking/pubs/schsac.pdf>. Accessed April 2017.

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